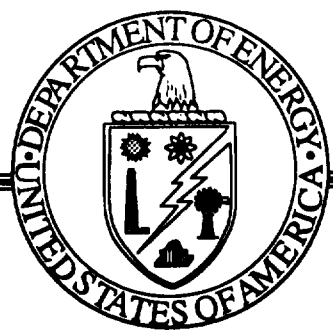
APPENDIX R

CHEMICAL INVENTORY DATA FROM FIELD SELF-EVALUATION REPORTS



APPENDIX R

CHEMICAL INVENTORY DATA FROM FIELD SELF-EVALUATION REPORTS

Carrying out the various missions of the Department of Energy (DOE) complex has required the use of numerous chemicals, ranging from common acids, bases, oxidants, solvents, heavy metals, and maintenance products (e.g., oils, greases, paints, adhesives) to specialty organics, explosives, hydrocarbon fuels, and toxic or pyrophoric gases. The quantities used have also varied widely (including large numbers of small laboratory quantities and large amounts of hazardous chemicals needed for manufacturing or large-scale processing operations), sometimes exceeding the threshold quantities established under the Occupational Safety and Health Administration's chemical process safety management regulations. In addition, DOE facilities treat, store, and dispose of a variety of hazardous wastes (which are regulated under the Resource Conservation and Recovery Act) and polychlorinated biphenyls (which are regulated under the Toxic Substances Control Act). To complicate matters, some of these chemical wastes are contaminated with radionuclides. The Chemical Safety Vulnerability Working Group requested that the 29 sites involved in the self-evaluation phase of the Chemical Safety Vulnerability Review provide estimates of hazardous chemicals, hazardous wastes, and chemical residuals present in the 84 facilities evaluated.

The inventory data in the table that follows were derived from the information furnished by these sites. The inventory data reported are not intended to represent a complete list of chemicals in use at DOE facilities but included examples of the types and amounts of chemicals that may exist in DOE facilities. The criteria used by the sites for reporting inventory data were as follows:

- Hazardous chemicals in quantities that meet or exceed 25 percent of the amounts listed in either 29 CFR 1910.119 or 40 CFR 68,
- Hazardous chemicals below the threshold quantities listed in 29 CFR 1910.119 or 40 CFR 68 that do not have adequate controls to prevent worker exposure,
- Residual hazardous chemicals present in nonoperating facilities, and
- Any other hazardous chemicals which are of concern to the sites.

The nomenclature used in the table is as follows:

HC denotes hazardous chemical;
HW denotes hazardous waste;
RS denotes residual hazardous material;
MW denotes mixed waste;
B denotes bulk material;
M denotes many small quantities; and
UNK denotes quantities of materials that were qualitative, unknown, or unreported in the self-evaluation.

The range, nature, and quantities of hazardous chemicals, wastes and residues at the facilities that provided inventory data in their self-evaluations are represented in Table Q-1.

TABLE Q-1. CHEMICAL INVENTORY DATA

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Argonne National Laboratory – East			
Chemistry Division, Building 200 (M-Wing Hot Cells)			
Lead Bricks	HW/B		4,430
Chemistry Technology, Building 205 (IFR Pyroprocessing)			
Cadmium Residues	RS/B		UNK
Waste Ion Exchange Facility, Building 579			
Radioactive Resin	RS/B		UNK
Argonne National Laboratory – West			
Analytical Laboratory, Building 752			
Lead Gloves	HW/M		UNK
Heavy Metal Solutions	HW/M		UNK
Diesel/Toluene	HW/B		UNK
Mixed Wastes	HW/M	55	
Perchloric Acid	RS/B		UNK
Bonneville Power Administration			
Ross Maintenance Facility			
Miscellaneous	HC/M		1,000
RCRA Wastes	HW/M		95,000
TSCA Wastes with PCB	HW/M		870
TSCA Wastes without PCB	HW/M		3,172
Brookhaven National Laboratory			
Hazardous Waste Storage Facility			
Chromium Waste	HW/B		15,000
Corrosive Waste	HW/M		900
Elemental Lead	HW/B		3,800
Evaporator Bottoms	HW/B		114,351
Ignitable Liquid	HW/B		4,400
Mercury Waste	HW/B		1,200
Oils	HW/B		32,245
Spent Solvents	HW/M		1,500

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Brookhaven National Laboratory (Continued)			
Wastewater Treatment Facility, Building 575, Tank 490-07/Operating			
Domestic Sewage Sludge	HW/B		UNK
Sodium Hypochlorite	HM/B		UNK
Energy Technology Engineering Center			
Kalina Facility			
Ammonia Hydroxide	HC/B		UNK
Anhydrous Ammonia	HC/B		UNK
Lubricating Oils	HC/B		UNK
Used Lubricating Oils	HW/B		UNK
Sodium Storage			
Lithium	HC/B		UNK
NaK (sodium-potassium)	HC/B		UNK
Sodium	HC/B		UNK
Fernald Environmental Restoration Management Corp.			
Biodenitrification Facility			
Sulfuric Acid	HC/B		UNK
Methanol	HC/B		UNK
Bulk Chemical Storage (HF Tank Car)			
Hydrofluoric Acid	HW/B	4,400	
Silo 3			
Characterized Waste	HW/B	932,000	
Water Treatment Plant, Building 20A			
Chlorine Gas	HC/B		900
Sulfuric Acid	HW/B		UNK
Hanford Site			
Chemical Engineering Laboratory, Building 2703 E			
Miscellaneous Chemicals	HC/M		UNK
Miscellaneous Chemical Wastes	HW/M		UNK
High Bay Engineering Laboratory, Building 324			
Nitrous Oxides	HW/M		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Hanford Site (Continued)			
Life Sciences Laboratory, Building 331			
Formaldehyde waste	MW/M	15	120
Liquid Chromatography Cocktail Waste	MW/M	15	120
Hazardous Wastes	HW/B	150	1,200
Inorganic/organic Acids	HC/M		UNK
Organic Solvents	HC/M		UNK
Inorganic Acid Residuals	RS/M		UNK
PUREX Plant, 202A Building			
Cadmium Nitrate (drums)	HC/B	600	5,000
Nitric Acid	HC/B	250,000	2,000,000
Nitric Acid	HC/B		16,000
Nitric Acid/Metal	MW/B		62,000
Paraffin/Tributyl Phosphate	HW/B	20,000	155,000
Sodium Hydroxide	HC/B	20,000	176,000
Sodium Nitrate	HC/B	120	1,000
Sodium Nitrate (100 bags)	HC/B		3,000
Plutonium Finishing Plant, Building 234-5Z			
Aluminum Nitrate Nonanhydrate	HC/B		39,355
Carbon Tetrachloride	HC/B	2,500	33,665
Chemical Waste	HW/M		UNK
Mixed Waste	HW/M		UNK
Nitric Acid	HC/B		38,977
Nitric Acid	HC/M	15	200
Nitric Acid	RS/M		UNK
Idaho National Engineering Laboratory			
Army Reentry Vehicle Facility Site (ARVFS)			
NaK Eutectic	MW/B		1,285
ICPP Fuel Processing Facility, Buildings 601-602-621			
Chromic Acid (in tanks)	RS/M		UNK
Hydrofluoric Acid	RS/M		UNK
Mercuric Nitrate	RS/M		UNK
Methyl Isobutyl Ketone	HC/B		10,700
Nitric Acid	HC/B		203,000

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Idaho National Engineering Laboratory (Continued)			
ICPP Tank Farm			
Aluminum Bearing Waste	MW/B		3,000
Dilute Waste Solution	MW/B		274,000
Fluoride Bearing Acidic	MW/B		28,000
Dichromate Solution with/Chro	HC/B		10,000
Sodium Bearing Acidic	MW/B		1,491,000
Zirconium Bearing Waste	MW/B		28,200
Power Burst Facility, Corrosive Waste Disposal Evaporation Pond			
Aqueous Solution with Cesium 137 and Chrome III	MW/B	700,000 (max)	
RWMC (Waste Storage Pad A, Waste Disposal Pit 9)			
Beryllium	MW/B		47,750
Carbon Tetrachloride	MW/B		114,000
Lead	MW/B		6,600
Mercury	MW/B		220,000
Nickel Carbonyl	MW/M		UNK
Potassium Nitrate	MW/B		126,000
Sodium Nitrate	MW/B		595,000
Sodium Nitrate	MW/B		270,000
Trichloroethane	MW/B		32,000
Trichloroethylene	MW/B		41,000
Kansas City Plant			
Chemical Storage Building			
Flammables	HC/M		20,000
Formaldehyde	HC/M		320
Nitric Acid	HC/B		160
Industrial Waste Water Pretreatment Plant			
Waste Sludge	HW/B		90,000/yr
Storage Facilities (Acid pad, L-Lot, and Red-X Lot)			
Corrosive Wastes	HW/B		UNK
Toxic Metal Wastes	HW/B		UNK
Flammable/Combustible Wastes	HW/B		UNK
Tank Farm			
Flammables	HW/B		73,500

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Lawrence Berkeley Laboratory			
Microelectronic Research Systems Laboratory, Building 70-A			
Dichlorosilane	HC/M		UNK
Hexamenthyldisilazane	HW/M		UNK
Phosphine in Nitrogen	HC/M		UNK
Phosphine in Silane/Ammonia	HC/M		UNK
Photoresist & Resins	HW/M		UNK
Silane	HC/M		UNK
Vacuum Pump Oil	HW/M		UNK
Lawrence Livermore National Laboratory			
Chemical and Materials Sciences Facility, Building 235			
Aqueous with HNO_3/U_{238}	MW/M		12
HEPA filter with Cr, Be, & U_{238}	MW/B		20
The B-222-229 Complex (8 buildings)			
Lab Wastes, Acidic	MW/M		275
Lab Wastes, Heavy Metals	MW/M		610
Lab Wastes, Unclassified	MW/M		430
Lab Wastes, Oils/Solvents	MW/M		400
Chem Waste with Silver Contam	MW/M		3
Acetone and U_{238}	MW/M		40
Solvents, Oils/Metal	MW/M		55
Metals and Tritium Contam	MW/M		10
Listed Solvent/Oils	MW/M		20
Miscellaneous Actinide Wastes	MW/M		3
Organic Lab Waste	MW/M		8
Solvent Lab Waste with Oil	MW/M		1
Scintilation Cocktail with Organics	MW/M		5
Aqueous Solv with HNO_3 and U_{238}	MW/M		40
Organic Solv with Acetone and U_{238}	MW/M		40
Waste Oil	MW/M		1
Waste Oil with Trace Metals	MW/M		0.5
Waste Scintilation Cocktail with Organics	MW/M		6
The B-825-827 Complex (7 Buildings)			
HEPA Filters with Cr, Be, U_{238}	MW/B		20
Nitric Acid/U_{238}	MW/B		12

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Los Alamos National Laboratory			
Chemical and Metallurgy Research Facility, Building TA-3-29			
Miscellaneous Mixed Wastes	MW/M		UNK
Miscellaneous Hazardous Chemicals	HC/M		UNK
Chemical Residues	RS/M		UNK
Waste Oils	MW/M		UNK
Gas Cylinder Distribution Plant, Building TA-3-170			
Acetylene	HC/B		708
Air, Compressed	HC/B		19,363
Ammonia	HC/B		
Argon	HC/B		26,223
Argon, Liquid	HC/B		46,531
Argon, Liquid Dewar	HC/B	600	
Carbon Dioxide	HC/B		4,000
Chlorine	HC/B		1,500
Chlorine	HC/B		1,500
Compressed Air	non-HC/B		
Freon 12	HC/B		625
Freon 22	HC/B		1,190
Helium	HC/B		3,232
Hydrogen	HC/B		638
Hydrogen/Argon Mix	HC/B		910
Isobutane	HC/B		300
MAPP Gas	non-HC/B	1,190	
Methane/Argon Mix	HC/B		455
Nitrogen	HC/B		18,373
Nitrogen, Liquid	HC/B		67,449
Nitrogen, Liquid Dewar	HC/B	14,000	
Oxygen	HC/B		11,229
Propane	HC/B		2,442
Sulfur Hexafluoride	HC/B		4,800
S-Site Explosives Blending Facility, Building TA-16-340			
Explosives	RS/M		UNK
Tritium High Pressure Lab, Building TA-33-86			
Miscellaneous Mixed Wastes	MW/M		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Los Alamos National Laboratory (Continued)			
Waste Storage Facilities, Technical Area 54, Area L & G			
Barium-Contaminated	HW/B	590	
Cadmium-Contaminated	HW/B	770	
Chem-Strip	HW/B	1,290	
Lead	HW/B	41,230	
Lithium Hydride	HW/B	1,930	
MW1-Flammables	MW/B	13,275	
MW2-Oxidizers	MW/B	430	
MW3-Acids	MW/B	2,550	
MW4-Reactives	MW/B	785	
MW5-Caustics	MW/B	5,255	
MW6-Poisons	MW/B	1,300	
Mercury-Contaminated	MW/B	670	
Sludges, Dewatered	MW/B	69,525	
Uranium Chips/Turnings	HW/B	6,435	
Morgantown Energy Technology Center			
Chemical and Gas Storage B-16			
Carbonyl Sulfide	HC/B		UNK
Hydrogen	HC/B		UNK
Hydrogen Sulfide	HC/B		UNK
Methane	HC/B		UNK
Nitrous Oxide	HC/B		UNK
Propane	HC/B		UNK
Sulfur Dioxide	HC/B		UNK
Miscellaneous Chemical Wastes	HC/B		UNK
Wastewater Treatment Facility			
Miscellaneous Chemicals	HC/M		UNK
Miscellaneous Chemical Wastes	HW/M		UNK
Mound Plant			
Explosives Formulation Facility, Building 1			
Explosives	HC/M		UNK
Miscellaneous Chemical Residues	RS/M		UNK
Hazardous Waste Storage, Building 72			
Miscellaneous Chemicals	HC/M		UNK
Miscellaneous Chemical Wastes	HW/M		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Mound Plant (Continued)			
PETN Recrystalization Facility, Building 27			
Miscellaneous Chemicals	HC/M		UNK
Miscellaneous Chemical Wastes	HW/M		UNK
Process/Laboratory Facility, WD Building, WDA Building			
Rad Waste (liquid)	MW/M		UNK
National Renewable Energy Laboratory			
Field Test Laboratory Building, South Table Mountain Site			
Alcohol	HC/B	100	
Laboratory Chemicals	HC/M		UNK
R&D Laboratory, Denver West Office Park, Building 16			
Lab Chemicals	HC/M		UNK
Miscellaneous Chemical Wastes	HW/M		880
Naval Petroleum Reserve in California			
35R Complex			
Butane	HC/B		440,000
Chlorine	HC/B		1,200
Ethyl Mercaptan	HC/B		14,800
Isobutane	HC/B		490,000
Nitrogen Oxide	HC/B		250
Propane	HC/B		370,000
Nevada Test Site			
Area 23, REECo Facility, Analytical Laboratory			
Numerous Lab Reagents	HC/M		UNK
Aqueous Solution Methylene Chloride	HW/M		UNK
Aqueous Solution of Leached Metals	HW/M		UNK
Halogenated Solvents	HW/M		UNK
Scintilation Cocktails	MW/M		UNK
Area 25, Acid Storage Tank at Nuclear Engine Test Stand			
Residual Caustic Soda	RS/M		UNK
Area 25, Flammable Storage Dock at Building 4320			
Yucca Mountain Drilling Samples	non-HW/B		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Nevada Test Site (Continued)			
North Las Vegas Maintenance Facility, Building 710			
Naphtha	HW/M		3
Paint Thinner	HC/M		UNK
Solvent Contaminated Rags	HW/M		UNK
Paint Sludge	HW/R		UNK
Oak Ridge K-25 Site			
Contaminated Burial Ground			
Arsenic Metal and Oxide	HW/M		1.5
Beryllium	HW/M	15	
Depleted Uranium Turnings	HW/M	10	
Drums, Uncharacterized Scrap Materials	HW/M		2,200 drums
Lead Nitrate	HW/M		1
Waste Filter Cake	HW/M	115	
Waste Oil	HW/M	75	
Tellurium	HW/M	140	
Thorium	HW/M		113
Thorium-Beryllium-Uranium Mix	HW/M	20	
UO_2F_2	HW/M	20	
Uranium Oxide	HW/M		133
Uranium Scrap	HW/M		18
Lithium Storage Vaults, Building K-25			
Lithium Hydroxide	HC/B		23,600,000
Ponds Waste Management Project			
Leachable Nickel	MW/B	2,700,000	31,000,000
Oak Ridge X-10 Site			
Emergency Waste Basin Site (Hazardous Waste Site 7821)			
Waste Basin (0.6 acres)	non-HW/B		UNK
Chemical Waste Evaporator (Hazardous Waste Site 3506)			
Lead sheets (shielding)	MW/B		UNK
Landfill Area (Hazardous Waste Site 7658)			
Construction Waste	HM/M		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Oak Ridge Y-12 Plant			
Hazardous Materials Bulk Storage, 9201-4			
Charcoal	HC/B		450
Ferric Sulfate	HC/B		55
Ferrous Sulfate	HC/B		180
Glues and Adhesives	HC/M		7
Hydraulic Fluid	HC/B		300
KCl and LiCl Electrolyte	HC/B		60,000
Metallic Mercury	HC/B		35,000
Oils and Lubricants	HC/M		20
Residuals	RS/B		41,580
Sodium Hydroxide with Mercury	HC/B		1,600
Sodium Sulfate	HC/B		
Compressed Gas Bulk Storage Warehouse, 9720-5			
Miscellaneous Chemicals	HW/M		UNK
Miscellaneous Chemical Residues	HW/R		UNK
Pantex Plant			
Explosives Machining Facilities, Building 11-50			
Explosive Parts (C1-A)	HC/M		2,000
Explosive Scrap (C1-A)	HC/M		200
Explosives Machining Facilities, Building 12-24N			
Class A Explosive Parts	HC/M		2,000
Explosive Scrap Class A	HC/M		200
High Explosives Synthesis Facility, Building 11-36			
Class-A Explosives	HC/M		10/mo
Miscellaneous Chemical Wastes	HW/M		300/mo
Sewage Treatment Facility, Building 13-47			
Chlorine (gas)	HC/B		1,150
Sulfuric Acid (gas)	HC/B		4,800
Pinellas			
Industrial Wastewater Neutralization, Building 550			
EPA Hazardous Waste (F006)	HW/B		
Sulfuric Acid	HC/B	500	7,600

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Pinellas (Continued)			
Tank Farm at the Liquid Waste Storage Area near Building 1040			
Flammables (various)	RS/M	Empty	
Toxics (various)	RS/M	Empty	
Pittsburgh Energy Technology Center			
Wastewater Treatment Facility			
Caustic Soda Tank	HC/B		UNK
Diesel Fuel for Emergency Generator	HC/B		UNK
Ferric Chloride	HC/B	250 gal	
Waste Oil	HW/B		UNK
Rocky Flats Plant			
Analytical Laboratory, Building 559			
Mixed Residuals	MW/M		UNK
Mixed Waste	HW/M	200 gal	
Moratorium Waste	HW/M		UNK
Analytical Laboratory, Building 881			
Residual Uranium	HW/M		UNK
Hazard Waste (mixed)	HW/M	375	
Hazardous Chemicals	HC/M		UNK
Industrial Waste Storage Tank, Building 207			
Low-Level Radwaste	RS/M	Empty	
Warehouse and Machine Shop, Building 551			
Chlorine (gaseous)	HC/B		400
Flammable Solvents, Paints, and Aerosol Cans	HC/M		
Waste Storage and Analytical Laboratory, Building 371			
Acids	HC/M		UNK
Bases	HC/M		UNK
Flammable Solvents	HC/M		UNK
Hazardous Waste (mixed)	MW/M		UNK
Toxic Chemicals	HC/M		UNK
Sandia National Laboratory			
Hazardous Waste Management Facility, Building 958			
Hazardous Wastes	HW/B	200 drums	

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Sandia National Laboratory (Continued)			
Laboratory Facilities, Building 805, 806, 807 (Tech Area #I)			
Explosives	HC/M	2	
Mixed Wastes	MW/M	8.5 ft^3	
Light Initiated Explosive Test Facility, Building 6715			
Residual Silver in Soil	RS/M		UNK
Microprocessor Development Laboratory, Building 858			
Hydrochloric Acid	HC/B		68,350
Sulfuric Acid	HC/B		2,000
Sodium Hydroxide	HC/B		6,500
HF Wastes	HW/B	1,260/yr	
Process Development Laboratory, Building 878			
Hydrochloric Acid	HC/M	2,320	
Savannah River Site			
100-P Area, Sodium Hypochlorite Facility, No. 186-001			
Residual Paints	RS/M		UNK
Sodium Hypochlorite	HC/M	150	
200-F Area, CTS Pits and Facilities, No. 242-003			
Hazardous Waste	HW/M		UNK
Moratorium Waste	HW/M		UNK
Residuals	RS/M		UNK
412-D Area, Heavy Water Extraction Facility			
Asbestos	HC/B	40,000 yd^3	
Lead-Based Paint	HC/M		UNK
Low PH Material (oily subs)	HW/M		UNK
RCRA Corrosive	RS/M		6,000
Sulphur Residues in Piping	RS/M		UNK
Transite Wall Tile	HC/B		UNK
99-H Area, Maintenance Facility, Building 299			
High-level mixed waste	HW/B	1,680	
Moratorium waste	HW/M		UNK

CHEMICAL NAME	CHEM/TYPE	VOL/GAL	QUANT/LB
Savannah River Site (Continued)			
H-Area Tank Farm, Waste Reduction Facility			
High-Level Waste	HW/B	74,178 m^3	
Residuals	RS/M		UNK
ITP/ESP, Waste Reduction/Wastewater Facility			
Benzene	HC/B		UNK
Strategic Petroleum Reserve			
West Hackberry Facility			
Crude Oil	HC/B	219,000,000 barrels	
West Valley Demonstration Project			
Analytical Environmental Laboratory			
Corrosive Wastes (neutralized)	HW/M	900/yr	
Chemical Residues	RS/M		UNK
Hazardous Waste Storage Locker			
Stored Hazardous Waste	HW/B		UNK
Stored Mixed Wastes	MW/B		UNK
Supernate Treatment System			
Sodium Hydroxide	HC/M		UNK
Western Area Power Administration			
Phoenix Maintenance Facility			
Miscellaneous Chemical Waste	HW/M		13,000